

## ABSTRACT

A Raman amplifier having a great Raman amplification gain is disclosed. An optical transmission system 1 is provided with an optical fiber 31 for Raman amplification and an optical multiplexer 41 between a transmitter 10 and a receiver 20 in the order of enumeration, and further provided with a pump light source 51 for Raman amplification that is connected with the optical multiplexer 41. The wavelength of signal light to be transmitted from the transmitter 10 to the receiver 20 is at  $1.65\mu\text{m}$  band, and the wavelength of the pump light that is output from the light source 51 is C-band or L-band. Since the pump light for Raman amplification propagates at a low loss through the optical fiber for Raman amplification, a great Raman amplification gain can be attained by the Raman amplifier.